



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,005	07/15/2003	Koji Abc	740709-503	6048

22204 7590 04/03/2006

NIXON PEABODY, LLP  
401 9TH STREET, NW  
SUITE 900  
WASHINGTON, DC 20004-2128

EXAMINER

ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
----------	--------------

1745

DATE MAILED: 04/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/619,005

Applicant(s)

ABE ET AL.

Examiner

Raymond Alejandro

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 15-20 and 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-20 and 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This office action is responsive to the amendment filed on 03/17/06. The applicant has overcome the objections and the 35 USC 102 rejections by canceling certain claims. Refer to the abovementioned amendment for specific details on applicant's rebuttal arguments and remarks. However, the instance claims are finally rejected over the same art as set forth hereinbelow and for the reasons of record:

#### ***Claim Disposition***

1. Claims 1-14 and 21 have been cancelled.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 1745

4. Claims 15-20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Japanese document 09-161845 (hereinafter referred to as "*the JP'845*") in view of Gagne et al 4475994.

Concerning claims 15-16:

The JP'845 discloses a non-aqueous electrolyte secondary battery comprising a non-aqueous electrolyte solution (TITLE) including organic solvents and a lithium compound dissolved (*the electrolyte*) therein (ABSTRACT). The JP'845 discloses the use of dinitrile compounds in the electrolytic solution (SECTION 0015) including at least succinonitrile and glutaronitrile (SECTION 0025-0026). **EXAMPLE 6** exemplified the use of glutaronitrile in electrolytic solutions (EXAMPLE 6). The JP'845 clearly discloses that all of the solvents can be used alone or in combination, that is, mixture thereof (SECTION 0026, 0015, 0002). *Thus, the JP'845 at once envisage the combined use of the aforementioned electrolyte solvents.*

**EXAMPLES 5-6** exemplified the use of nitrile compounds including propionitrile in an amount of 17.8 vol %; and glutaronitrile in an amount of 19 vol % of the electrolytic solutions (EXAMPLES 5-6).

With respect to claim 17:

Disclosed is the use of cyclic carbonate such as propylene carbonate, ethylene carbonate and the likes; cyclic ester such as  $\gamma$ -butyrolactone; linear carbonate such as dimethyl carbonate, diethyl carbonate, ethyl methyl carbonate; and/or ether such as tetrahydrofuran and the likes (SECTION 0002, SECTION 0002, 0015, 0020, 0024-0026/ EXAMPLES 1-8 & COMPARATIVE EXAMPLES 1-4).

On the matter of claims 18-20:

**EXAMPLES 1-8 and COMPARATIVE EXAMPLES 1-4** show the combined use of linear carbonate with cyclic carbonates or a cyclic ester or an ether including the following volume percents: 20:80 vol %, 50:50 vol %; 18:82 vol %; 30:70 vol %; 17:83 vol %; 25:75 vol %; 17.8:82.2 vol %; 19:81 vol %; 22:78 vol %. *Thus, the specific volume ratios are disclosed with sufficient specificity. Additionally, it is noted that since the claimed volume ratios do also encompass a large range of possible volume ratios (i.e. 1:9 to 9:1 or 1:99 to 99:1), the JP'845 also meet the specific claimed requirement.* Lastly, given that the JP'845 clearly discloses that all of the solvents can be interchangeably used or used in combination, that is, any mixture thereof (SECTION 0026, 0015, 0002). *Thus, the volume ratios disclosed in EXAMPLES 1-8 and COMPARATIVE EXAMPLES 1-4 are equally applicable to any combination of solvents.*

With regard to claim 22:

The JP'845 teaches lithium batteries (SECTION 0001-0002/ABSTRACT) comprising a positive electrode and a negative electrode (ABSTRACT) wherein the negative electrode is a carbonaceous materials having a  $d_{002}$  lattice distance of 0.3365 nm or more (SECTION 0009 & 0012).

The JP'845 disclose an electrolytic solution according to the foregoing aspects. However, the preceding prior art does not expressly disclose the specific nitrile amount.

Gagne et al disclose an electrochemical cell (ABSTRACT) comprising an aprotic solvent containing a dissolved salt (COL 3, lines 61-64) wherein nitriles such as succinonitrile, adiponitrile among others are added to the electrolyte in an amount of at least about 1 % by weight of thereof to the total weight of the electrolyte solution to stabilize the electrolyte. *Thus,*

Art Unit: 1745

*Gagne et al teach with sufficient specificity the use of a specific amount of specific dinitrile compounds.*

With these references, it would have been obvious to one skilled in the art at the time the invention was made to use the specific nitrile amount of Gagne et al in the battery of the JP'845 because Gagne et al teaches that nitriles are added to the electrolyte in the claimed amount to stabilize the electrolyte. Thus, the specific nitrile amount provides improved chemical stability. *In this particular, the teachings of Gagne et al are found pertinent and applicable to the teachings of the JP'845 and the field of applicant's endeavor as Gagne et al is strictly concerned with the addition of nitrile to electrolyte to stabilize it regardless of the specific chemical system (i.e. organic or aqueous), and thus, one of ordinary skill in the art would have easily arrived at the claimed invention by simply looking at the teachings of Gagne et al.*

#### ***Response to Arguments***

5. Applicant's arguments filed 03/17/06 have been fully considered but they are not persuasive.
6. Applicant's arguments with respect to claim 22 have been considered but are moot in view of the new ground(s) of rejection.
7. The main contention of applicant's arguments is premised on the assertion that neither JP'845 nor Gagne, alone or in combination, suggest or render obvious each and every feature in the claims, interalia, "*the specific dinitrile compound in an amount of 0.001 to 10 wt %*". Nonetheless, applicant's assertion is insufficient to overcome the prima-facie case of non-patentability. All in all, the JP'845 discloses all the claimed features (*viz. the non-aqueous*

Art Unit: 1745

*electrolytic solution, solvent and electrolyte and the dinitrile compound*) with the exception of the specific amount of the dinitrile compound. To make up for this shortcoming, the Gagne reference has been introduced, in combination with the JP'845, because it teaches an electrochemical cell comprising aprotic solvent containing a dissolved salt wherein specific nitriles such as succinonitrile or adiponitrile are added to the electrolyte in an amount of at least about 1 % by weight thereof to stabilize the electrolyte. Thus, the Gagne reference not only specifically names the dinitrile compound to be added to the electrolyte, the Gagne reference also provides specific guidance to choose any one of these two dinitrile compounds because it names or identifies only 13 nitrile compounds in total. Thus, picking and choosing any one (1) of two (2) dinitrile compounds out of a total of 13 nitrile compounds does not involve a complicated selection criteria or a complex degree of selectivity to a person possessing a level of ordinary skill in the art. Succinctly stated, Gagne discloses a reduced or a small number of possible nitrile compounds to be added to an electrolyte so that selecting any one of the 13 nitrile compounds simply requires less than ordinary skill in the art. Thus, Gagne specifically names the dinitrile compounds, and at once envisages the use of the specific dinitrile compounds within the claimed weight percent for the benefit of improving electrolyte stabilization.

8. The applicant also argues that any inference of obviousness is rebutted by a showing of unexpected results. See the amendment dated 03/17/06, pages 7-8. In support of his argument, the applicant refers to examples A-1 to A-7 in Table 1 at page 14 of the specification. Having reviewed the showing in the specification, the examiner determines that the applicants have not demonstrated that the claimed subject matter as a whole imparts unexpected results. In re **Klosak**, 455 F.2d 1077, 1080, USPQ (CCPA 1972)(*The appellants have the burden of showing*

Art Unit: 1745

*that the claimed subject matter imparts unexpected results.); In re Heyna, 360 F.2d 222, 228, 149 USPQ 692, 697 (CCPA 1966) (" it is incumbent upon appellants to submit clear and convincing evidence to support their allegation of unexpected property.").*

As such, the examiner points that the objective evidence of nonobviousness is not commensurate in scope with the instant claims. The electrolytic solutions and battery cells supposedly representative of the claimed invention referred to in the specification are limited to employing an electrolytic solution made of specific amounts of a specific non-aqueous solvent, a specific electrolyte and, above all, a very specific amount of a specific dinitrile compound. Although these exemplified electrolytic solutions and battery cells appear to show some improvement in discharge capacity retention, the applicant have not provided any evidence, much less any explanation, as to why this limited showing is sufficient to support, for example, the multifarious non-aqueous electrolytic solutions made of materially different amounts of dinitrile compounds and materially different additional components included in the claims under examination. This especially true in this case since the applicants' own specification indicates that the amounts of dinitrile compounds used, as well as the presence or absence of other components, affect discharge capacity retention of a battery. Thus, it cannot be said that the applicant has carried his burden of showing that the claimed subject matter as a whole imparts unexpected results, thereby rebutting the prima facie case established by the examiner.



Art Unit: 1745

In summary, from viewing Examples A-1 to A-7 in Table 1 (applicant's specification at page 14), it can be fairly concluded that superior discharge capacity retention of a specific battery (specific battery components and material thereof are unclaimed and/or unknown), to certain extent, is obtained when only: a) adiponitrile in an amount of 0.05 to 1 weight %, or b) glutaronitrile in an amount of 0.2 wt % are used. Other than that, there is no further evidence to substantiate that the entire claimed range of 0.001 to 10 wt % and/or other dinitrile compounds such as those recited in claims 16 (with the exception of adiponitrile or glutaronitrile) will produce a battery exhibiting the same superior discharge capacity retention.

### ***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).
10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action (*for claim 22 only*). Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 1745

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282.

The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro  
Primary Examiner  
Art Unit 1745

  
**RAYMOND ALEJANDRO  
PRIMARY EXAMINER**